

FIG. 2 (PRIOR ART)

00000 5229900

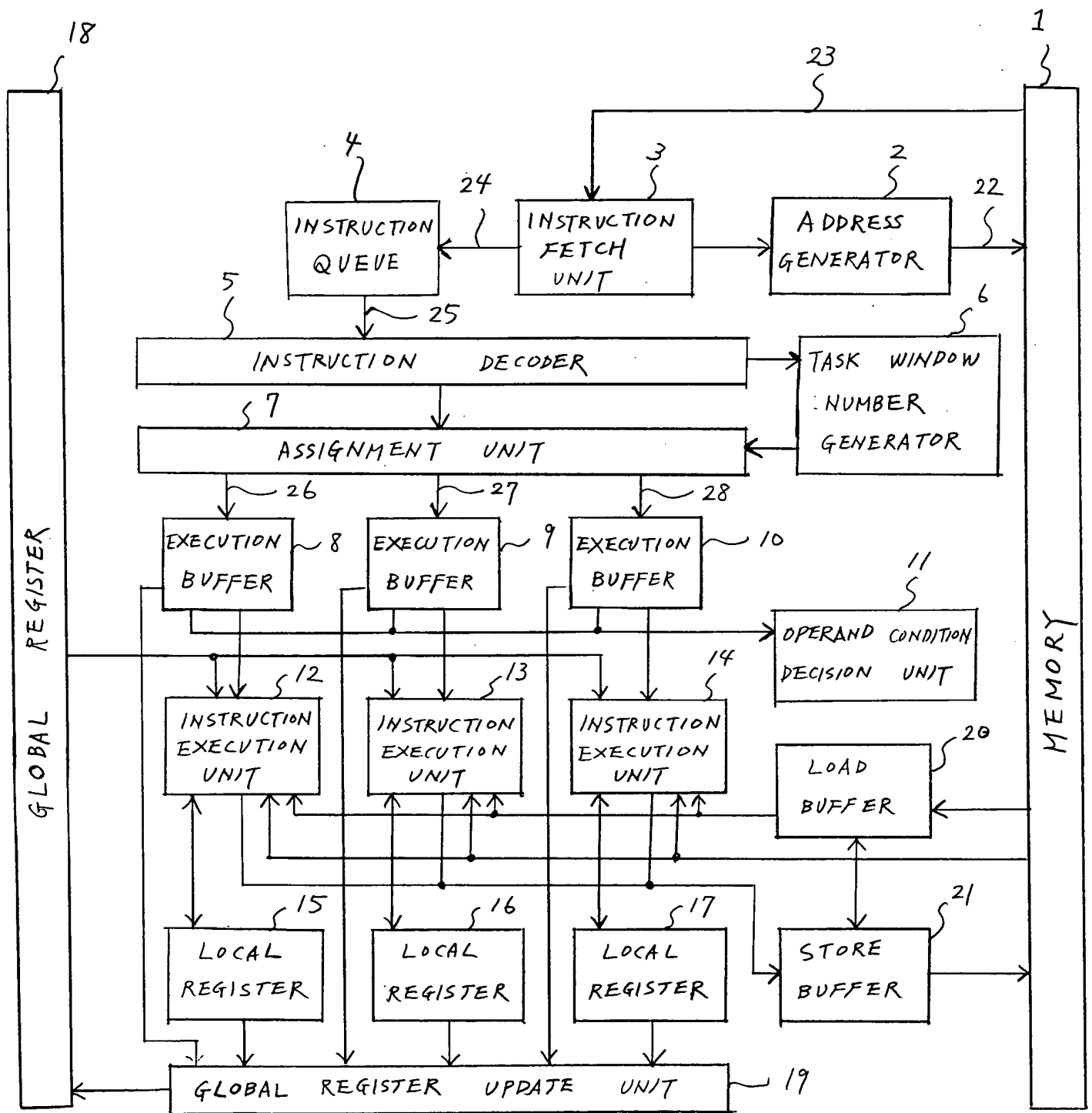


FIG. 3

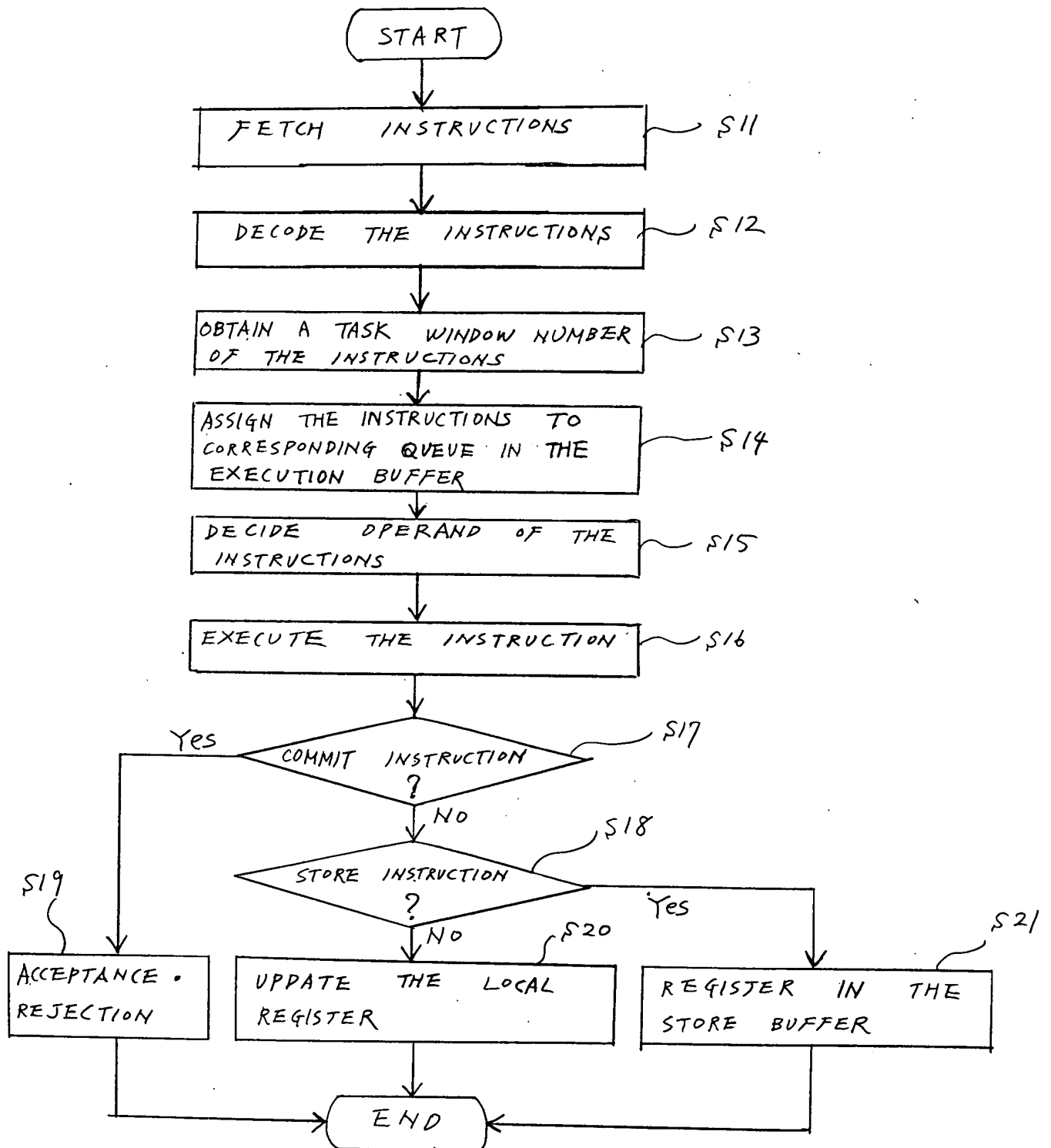
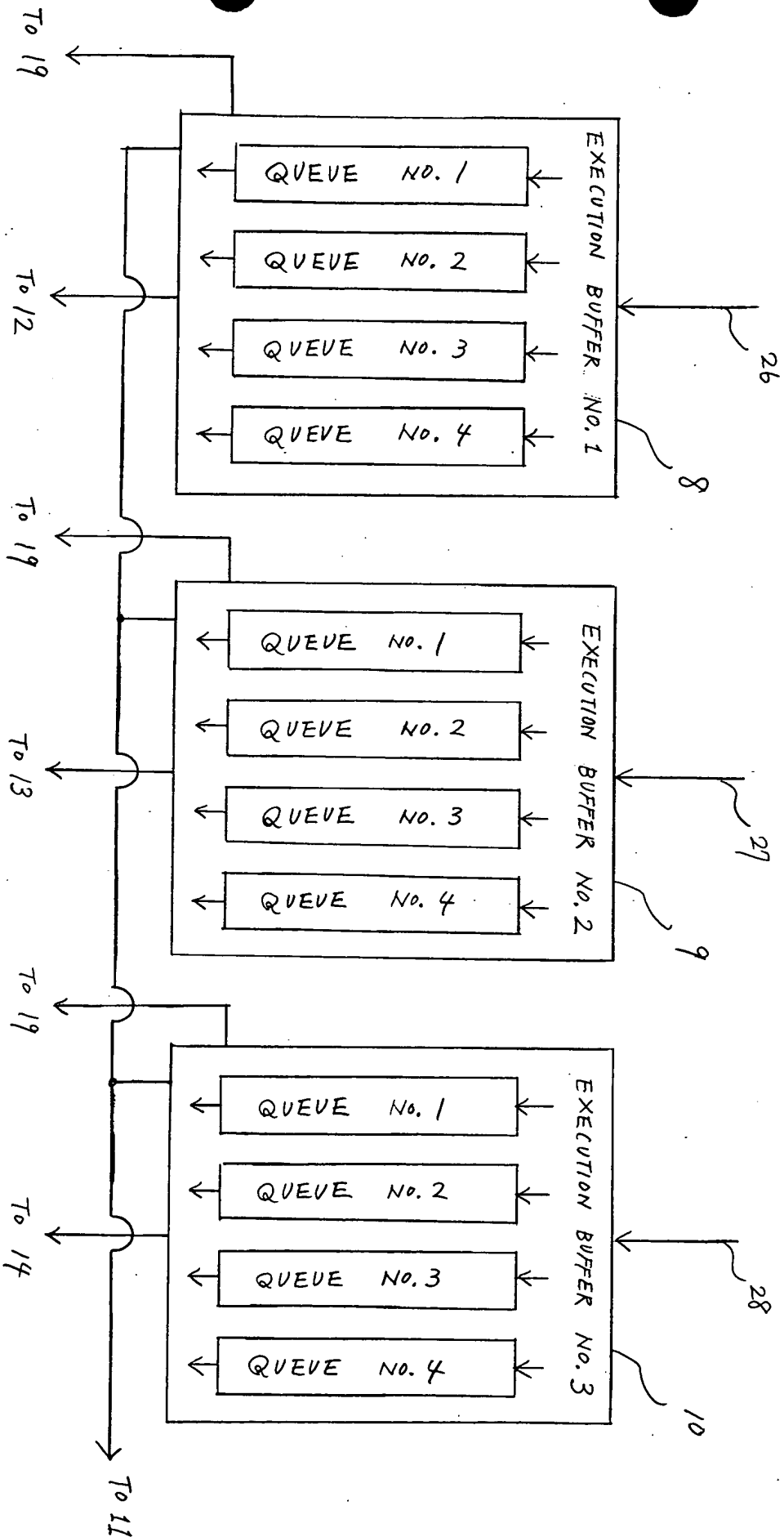


FIG. 4



F I G. 5

CLASS OF INSTRUCTION	OPERAND DATA	EXCEPTIONAL DATA
l w	7, 3, 0 (0)	
s l l	3, 4, 0 (6)	
a d d i u	4, 5, 0 (100)	
a d d u	5, 6, 0 (0)	

← t a i l  
 ← e x e c u t e  
 ← c o m m i t  
 ← h e a d

FIG. 6

REGISTER	VALUE	VALID
\$ 1	100	1
\$ 2	15	0

# EXAMPLE OF PROGRAM CODE

li P : \$ 2, 2

IN CASE OF DECODING, THE VALID OF REGISTER "\$2" IS SET "0" BY PRODUCTION FLAG "P:"

SW \$2, 0 (\$4)

THE REGISTER "\$2" IS NON-USE UNTIL THE VALID IS CHANGED TO "1".

IF THE VALUE "15" IS CHANGED TO "2", THE VALID "0" IS CHANGED TO "1".

FIG. 7







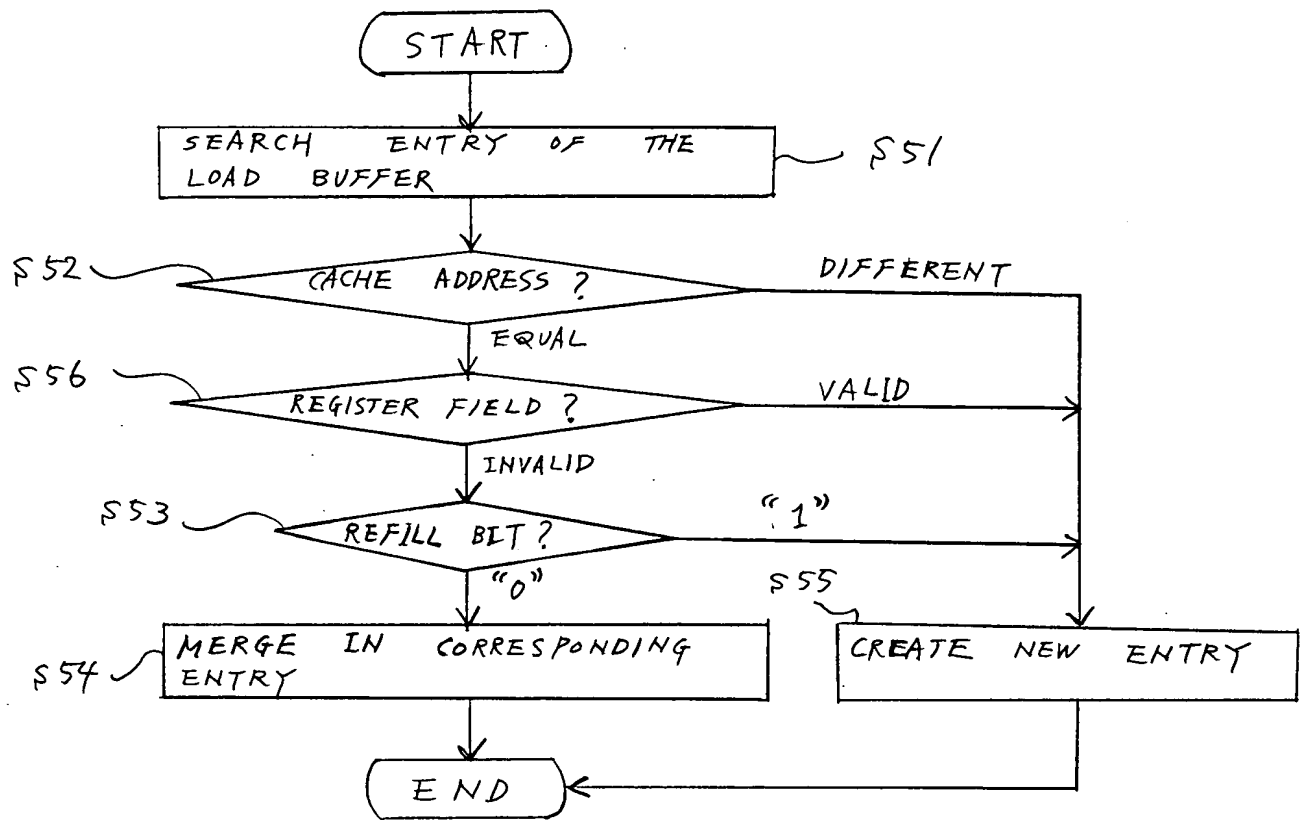


FIG. 11

TASK NUMBER	LOAD ADDRESS	LOAD WIDTH	CNF	VLD
3	1 0 0 0 9 2 3 a	H	0	1
4	1 0 0 1 0 2 4 c	W	1	0
2	1 0 0 2 1 4 9 d	B	1	1
	..			

FIG. 12



```

        lw. e    $4, Int_Glob ($0)
        slti     $3, $4, 101
        bne      $3, $0, $L14
        j         $L9
        sw       $0, 0 ($56)
$L14:    addiu   $3, $0, 3

```

FIG. 15

```

1: lw. e    $4, Int_Glob ($0)
2: sw       $0, 0 ($56)
1: slti     $3, $4, 101
1: bcmt. ne  $3, $0, $L14,
            |1, 2|, |2|
1: j         $L9
$L14: 2: addiu   $3, $0, 3

```

FIG. 16

002222-092222

```

        lw      $3, 0 ($57)
        sw      $16, 16 ($sp)
$ L41:  lw      $9, 0 ($11)
        addiu   $11, $11, 16
        sw      $9, 0 ($3)
        bne     $11, $10, $L41

```

Fig. 17

```

1: lw      $3, 0 ($57)
3: lw      $9: P, 0 ($11)
3: addiu   $11, $11, 16
4: sw      $9, 0 ($3)
2: sw      $16, 16 ($sp)
3: lcmt. ne $11, $10, $L41,
           |3, 4|, |1, 2|

```

Fig. 18

```

1: lw      $3, 0 ($57)
1: addu     $9, $3, $4
3: d. addu  $9, $3, $4
3: sw      $9, 0 ($57)
3: dcmt    $9, |3|

```

Fig. 19

INSTRUCTION  
NUMBER

↓

↓

11

1

```

1: move P:$_5, $4 [1]
1: addiu P:$_1, $0, 65 [2]
1: addiu P:$5, $0, 1 [3]
1: lw $_1, 0 ($_5) [4]
1: nop [5]
1: nop [6]
1: addiu P:$6, $_1, 10 [7]
1: nop [8]
1: nop [9]

$L46:
3: addiu $6, $6, -1 [10]
2: lbu.e $_2, Ch1_Glob ($0) [11]
3: lw.e P:$1_3, Int_Glob ($0) [12]
3: subu P:$_4, $6, $_3 [13]
2: bcmtn.e $_2, $_1, $L46 [14]
    |1_1, 1_3, 2_1, 2_2, 3_1, 3_3, 3_4|, |1_3, 1_4,
    _3, 3_4|

```

2

\$ L 4 8 :

```

4 : move P : $ 5, $ 0 [1 5]
4 : sw $ _4, 0 ($ _5) [1 6]
2 : nop [1 7]
4 : nop [1 8]

3 : nop [1 9]
2 : nop [2 0]
1 : l cmt. ne $ 5, $ 0, $ L 4 6 [2 1]
    |1_3, 1_4, 2_2, 3_1, 3_3, 3_4|, ||
1 : r cmt $ 3 1 [2 2]
    |1_1|
1 : nop [2 3]
1 : nop [2 4]

```

3.

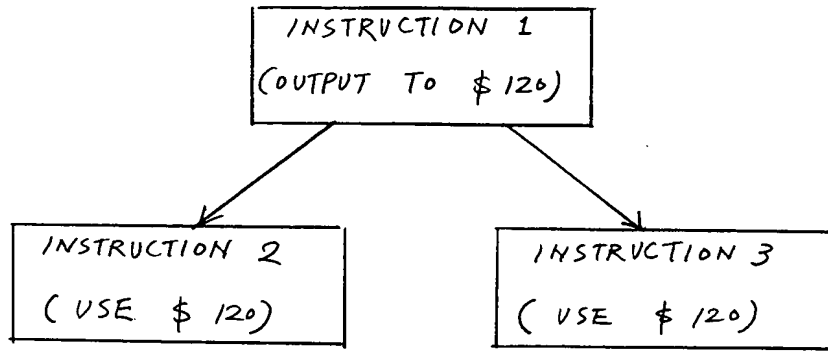


FIG. 21

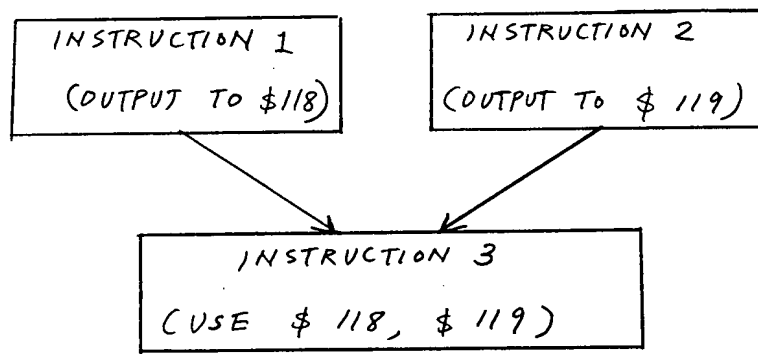


FIG. 22

reflect:

move \$114, \$6: move \$113, \$5: move \$112, \$4  
slti \$115, \$114, 2: nop: nop  
bne \$115, \$0, \$L109: nop: nop  
lw.e \$117, boardsize(\$0): addiu \$116, \$113, 1: nop  
subu \$113, \$117, \$116: nop: nop

SL109:

addiu \$118, \$0, 1: nop: nop  
beq \$114, \$118, \$L111: nop: nop  
addiu \$119, \$0, 3: nop: nop  
bne \$114, \$119, \$L110: nop: nop

SL111:

lw.e \$121, boardsize(\$0): addiu \$120, \$112, 1: nop  
subu \$112, \$121, \$120: nop: nop

SL110:

lw.e \$123, boardsize(\$0): nop: nop  
mult \$113, \$123: nop: nop  
nop: nop: nop  
nop: nop: nop  
mflo \$124: nop: nop  
jr \$31: addu \$2, \$124, \$112: nop

FIG. 23







reflect:

3:lw.e \$123, boardsize(\$0); 1:move \$114, \$6; 1:move \$113, \$5  
3:mult \$113, \$123; 1:slti \$115, \$114, 2; 2:move \$112, \$4  
3:nop; 3:lw.e \$117, boardsize(\$0); 3:addiu \$116, \$113, 1  
3:nop; 1:bne \$115, \$0, \$L109; 3:subu \$113, \$117, \$116

\$L109:

3:mflo. \$124; 1:addiu \$118, \$0, 1; 3:addiu \$119, \$0, 3  
3:nop; 1:beq \$114, \$118, \$L111; 3:nop  
1:nop; 1:bne \$114, \$119, \$L110; 1:nop

\$L111:

1:addiu \$120, \$112, 1; 1:lw.e \$121, boardsize(\$0); 1:nop  
1:subu \$112, \$121, \$120; 1:nop; 1:nop

\$L110:

1:addiu \$2, \$124, \$112; 1:jr \$31; 1:nop

F 19. 26

reflect:

3:lw.e \$123, boardsize(\$0): 1:move \$114, \$6: 1:move \$113, \$5  
3:mult \$113, \$123: 1:slti \$115, \$114, 2: 2:move \$112, \$4

3:nop: 3:lw.e \$117, boardsize(\$0): 3:addiu \$116, \$113,

3:nop: 1:cmt.ne \$115, \$0.: 3:subu \$113, \$117, \$116

12\_1, 2\_3, 3\_1, 3\_2, 3\_3, 12\_3, 3\_3

3:mflo \$124: 1:addiu \$118, \$0, 1: 3:addiu \$119, \$0, 3

3:nop: 1:bcmt.eq \$114, \$118, \$L111.: 3:nop

11\_3, 2\_1, 3\_3, 3\_4, 13\_3, 3\_4

3:nop: 1:bcmt.ne \$114, \$119, \$L110.: 1:nop

11\_1, 2\_1, 3\_1, ||

111:

1:addiu \$120, \$112, 1: 1:lw.e \$121, boardsize(\$0): 1:nop

1:subu \$112, \$121, \$120: 1:nop: 1:nop

\$L110:

1:addiu \$2, \$124, \$112: 1:rcmt \$31.: 1:nop

11\_1, 2\_1

F I 9. 27

reflect:

```
3:lw.e $_1, boardsize($0); 1:move P:$_1, $6; 1:move P:$3, $5
3:mult $3, $_1; 1:slli $_1, $_1, 2; 2:move P:$7, $4
3:nop; 3:lw.e P:$3_2, boardsize($0); 3:addiu $_1, $3, 1
3:nop; 1:cmt.ne $_1, $0.; 3:subu $3, $_2, $_1
    |2_1, 2_3, 3_1, 3_2, 3_3|, |2_3, 3_3|
3:mflo P:$_2; 1:addiu $_2, $0, 1; 3:addiu P:$2_3, $0, 3
3:nop; 1:bcmt.eq $_1, $_2, $L111.; 3:nop
    |1_3, 2_1, 3_3, 3_4|, |3_3, 3_4|
1:nop; 1:bcmt.ne $_1, $_3, $L110.; 1:nop
    |1_1, 2_1, 3_1|, ||
$L111:
1:addiu $_3, $7, 1; 1:lw.e P:$1_4, boardsize($0); 1:nop
1:subu $7, $_4, $_3; 1:nop; 1:nop
$L110:
1:addiu $2, $_2, $7; 1:rcmt $31.; 1:nop
    |1_1, 2_1|
```

FIG. 28